

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference R 42992	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/EP2004/003984	International filing date (day/month/year) 15/04/2004	(Earliest) Priority Date (day/month/year) 15/04/2003
Applicant INTERCELL AG		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 9 sheets.

☒

It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐

The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

☒

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2.

☐

Certain claims were found unsearchable (See Box II).

3.

☒

Unity of invention is lacking (see Box III).

4. With regard to the title,

☒

the text is approved as submitted by the applicant.

☐

the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒

the text is approved as submitted by the applicant.

☐

the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regards to the drawings,

- a. the figure of the **drawings** to be published with the abstract is Figure No. _____

☐

as suggested by the applicant.

☐

as selected by this Authority, because the applicant failed to suggest a figure.

☐

as selected by this Authority, because this figure better characterizes the invention.

☒

- b. none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP2004/003984

Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.b of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, the international search was carried out on the basis of:

a. type of material

☒

a sequence listing

☐

table(s) related to the sequence listing

b. format of material

☒

in written format

☒

in computer readable form

c. time of filing/furnishing

☒

contained in the international application as filed

☒

filed together with the international application in computer readable form

☐

furnished subsequently to this Authority for the purpose of search

2. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2004/003984

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K14/315 C07K16/12 C07K19/00 C07K16/46 C12N5/12
C12N15/02 A61K39/09 C12Q1/68 G01N33/569 A61P31/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, EMBL, EMBASE, MEDLINE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/083855 A (CHAKRAVARTI DEB NARAYAN ; RUSSELL DAVID PARRISH (US); WOOTERS JOSEPH L) 24 October 2002 (2002-10-24) page 85, line 15 - page 108, line 4 claims 1-11,25-28,59-71,96,105 see in particular SEQ ID Nos. 209 and 424.	1,2, 5-11, 14-37
X	WO 02/077021 A (CHIRON SPA ; MASIGNANI VEGA (IT); FRASER CLAIRE (US); TETTELIN HERVE () 3 October 2002 (2002-10-03) page 8, line 30 - page 34, line 40 see in particular SEQ ID Nos. 4715 and 4716. claims 1-16	1,2, 5-11, 14-37
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

25 August 2004

Date of mailing of the international search report

25. 10. 2004

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP2004/003984

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HOSKINS J ET AL: "Genome of the Bacterium Streptococcus pneumoniae Strain R6" JOURNAL OF BACTERIOLOGY, WASHINGTON, DC, US, vol. 183, no. 19, October 2001 (2001-10), pages 5709-5717, XP002231307 ISSN: 0021-9193 cited in the application the whole document	1,2, 5-11, 14-37
X	-& DATABASE EMBL EBI; 7 September 2001 (2001-09-07), HOSKINS ET AL.: "Streptococcus pneumoniae R6 section 1" XP002293255 retrieved from HTTP://WWW.EBI.AC.UK Database accession no. AE008385 cited in the application the whole document	1,2, 5-11, 14-37
X	----- TETTELIN H ET AL: "Complete genome sequence of a virulent isolate of Streptococcus pneumoniae" SCIENCE, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE,, US, vol. 293, no. 5529, 2001, pages 498-506, XP002218261 ISSN: 0036-8075 cited in the application the whole document	1,2, 5-11, 14-37
X	-& DATABASE EMBL EBI; 31 July 2001 (2001-07-31), TETTELIN ET AL.: "Streptococcus pneumoniae TIGR4 section 1" XP002293256 retrieved from HTTP://WWW.EBI.AC.UK Database accession no. AE007318 cited in the application the whole document	1,2, 5-11, 14-37
A	----- NABORS G S ET AL: "Immunization of healthy adults with a single recombinant pneumococcal surface protein A (PspA) variant stimulates broadly cross-reactive antibodies to heterologous PspA molecules" VACCINE, BUTTERWORTH SCIENTIFIC. GUILDFORD, GB, vol. 18, no. 17, March 2000 (2000-03), pages 1743-1754, XP004190054 ISSN: 0264-410X the whole document ----- -/--	1,2, 5-11, 14-37

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2004/003984

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	BETHE GESINA ET AL: "The cell wall-associated serine protease PrtA: A highly conserved virulence factor of <i>Streptococcus pneumoniae</i> " FEMS MICROBIOLOGY LETTERS, vol. 205, no. 1, 27 November 2001 (2001-11-27), pages 99-104, XP002293235 ISSN: 0378-1097 the whole document	1,2, 5-11, 14-37
A	WIZEMANN T M ET AL: "Use of a whole genome approach to identify vaccine molecules affording protection against <i>Streptococcus pneumoniae</i> infection" INFECTION AND IMMUNITY, AMERICAN SOCIETY FOR MICROBIOLOGY. WASHINGTON, US, vol. 69, no. 3, March 2001 (2001-03), pages 1593-1598, XP002263818 ISSN: 0019-9567 the whole document	1,2, 5-11, 14-37
A	OVERWEG K ET AL: "The putative proteinase maturation protein A of <i>Streptococcus pneumoniae</i> is a conserved surface protein with potential to elicit protective immune responses" INFECTION AND IMMUNITY, AMERICAN SOCIETY FOR MICROBIOLOGY. WASHINGTON, US, vol. 68, no. 7, July 2000 (2000-07), pages 4180-4188, XP002158137 ISSN: 0019-9567 the whole document	1,2, 5-11, 14-37
A	WO 02/059148 A (CISTEM BIOTECHNOLOGIES GMBH ; AHSEN UWE (AT); ETZ HILDEGARD (AT); HAFN) 1 August 2002 (2002-08-01) the whole document	1,2, 5-11, 14-37

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP2004/003984

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 02083855 A	24-10-2002	CA 2444133 A1 WO 02083855 A2	24-10-2002 24-10-2002
WO 02077021 A	03-10-2002	CA 2439431 A1 EP 1373513 A2 WO 02077021 A2	03-10-2002 02-01-2004 03-10-2002
WO 02059148 A	01-08-2002	AT 410798 B AT 1302001 A BR 0207067 A CA 2436057 A1 CZ 20032201 A3 WO 02059148 A2 EP 1355930 A2 NO 20033364 A	25-07-2003 15-12-2002 15-06-2004 01-08-2002 17-03-2004 01-08-2002 29-10-2003 24-09-2003

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2004/003984

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

see annex

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

Invention 1: claims 1,2,5-11,14-37 (all partially)

An isolated nucleic acid molecule encoding a hyperimmune serum-reactive antigen or fragment thereof as defined in claim 1, but referring only to SEQ ID No. 1; a vector comprising said nucleic acid molecule; a host cell comprising said vector; a hyperimmune serum-reactive antigen comprising the amino acid sequence of SEQ ID No. 145; a fragment of the said hyperimmune serum-reactive antigen as defined in claim 14; a method of producing the said *S. pneumoniae* hyperimmune serum-reactive antigen or fragment thereof; a process for producing a cell which expresses the said *S. pneumoniae* hyperimmune serum-reactive antigen or fragment thereof; the use of the said nucleic acid molecule or the said hyperimmune serum-reactive antigen or fragment thereof for the manufacture of a pharmaceutical preparation; an antibody, or at least an effective part thereof which binds at least to a selective part of the said hyperimmune serum-reactive antigen or fragment thereof; a hybridoma cell line which produces the said antibody; a method of producing the said antibody; the use of said antibody for the preparation of a medicament for treating or preventing *S. pneumoniae* infections; an antagonist which binds to the said hyperimmune serum-reactive antigen or fragment thereof; a method of identifying an antagonist capable of binding to the said hyperimmune serum-reactive antigen or of reducing or inhibiting the interaction activity of the said hyperimmune serum-reactive antigen or fragment thereof; the use of the said hyperimmune serum-reactive antigen or fragment thereof for the isolation and/or purification and/or identification of an interaction partner; a process for in vitro diagnosing a disease or a bacterial infection based on determining the presence of the said nucleic acid sequence or the presence of the said hyperimmune serum-reactive antigen or fragment thereof; the use of said hyperimmune serum-reactive antigen or fragment thereof for the generation of a peptide binding thereto i.e. an anticaline, for the manufacture of a functional nucleic acid i.e. an aptamer or a spiegelmer, or of a functional ribonucleic acid i.e. a ribozyme, an antisense nucleic acid or a siRNA.

Inventions 2-45: claims 1,2,5-11,14-37 (all partially)

Idem as invention 1, but each of the inventions 2-45 referring to one of the further SEQ ID Nos. mentioned in claim 1 together with its respective corresponding SEQ ID No. according to claim 11.

Inventions 46-121: claims 3-10,12,14-37 (all partially)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Idem as invention 1, but each of the inventions 46-121
referring to one of the SEQ ID Nos. mentioned in claim 3
together with its respective corresponing SEQ ID No.
according to claim 12.

Inventions 122-133: claims 4-10,13-37 (all partially)

Idem as invention 1, but each of the inventions 122-133
referring to one of the SEQ ID Nos. mentioned in claim 4
together with its respective corresponing SEQ ID No.
according to claim 13.
